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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.          | CONFIRMATION NO. |
|---|-------------|----------------------|------------------------------|------------------|
| 10/024,444  | 12/18/2001  | Muralidhara Padigaru | 21402-224AG<br>(CURA-524 AG) | 3291             |
| 7590  | 12/14/2004  |                      | EXAMINER                     |                  |
| Janell Lawson<br>Intellectual property CuraGen Corporation<br>555 Long Wharf Drive<br>New Haven, CT 06551 |             |                      | LOCKARD, JON MCCLELLAND      |                  |
|   |             |                      | ART UNIT                     | PAPER NUMBER     |
|   |             |                      | 1647                         |                  |

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/024,444             | PADIGARU ET AL.     |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Jon M Lockard          | 1647                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5,8-10 and 12-52 is/are pending in the application.
- 4a) Of the above claim(s) 1-4,15-38,40,41 and 43-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 5,8-10,12-14,39 and 42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) 1-5,8-10 and 12-52 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/9/02 &amp; 3/19/03</u> .  | 6) <input checked="" type="checkbox"/> Other: <u>Sequence Alignment</u> .   |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group II, claims 5-14, 39, and 42 drawn to nucleic acids of SEQ ID NO:1, vectors and host cells comprising the same, and a method of recombinantly producing the polypeptide of SEQ ID NO:2, in the reply filed on 20 September 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. The restriction requirement is still deemed proper and is therefore made FINAL.

### ***Status of Application, Amendments, And/Or Claims***

3. Applicants' amendment filed on 20 September 2004 has been received and entered in full. Claims 1-52 are pending. Claims 6-7 and 11 have been cancelled, Claims 5, 9, and 12 have been amended, and claims 1-4, 15-38, 40-41, and 43-52 are withdrawn from further consideration

### ***Information Disclosure Statement***

4. The Information Disclosure Statements (IDS) submitted on 09 April 2002 and 19 March 2003 have been considered by the Examiner.

### ***Specification***

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Applicant is requested to avoid the

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use of “novel” in the title, as patents are presumed to be novel and unobvious. The following title is suggested: “G-protein coupled receptor (GPCR) polynucleotides”.

***Claim Rejections - 35 USC § 101 and 35 USC §112***

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 5, 8-10, 12-14, 39, and 42 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific, substantial, and credible asserted utility or a well established utility. Novel biological molecules lack an established utility and must undergo extensive experimentation to determine an appropriate specific, substantial, and credible utility.

10. The instant application discloses a nucleic acid set forth as SEQ ID NO:1 that encodes the protein set forth as SEQ ID NO:2, vectors and host cells comprising the same, pharmaceutical compositions comprising said nucleic acids, and kits comprising the same. The specification asserts that SEQ ID NO:2 is a G protein coupled receptor (GPCR) based on a high degree of homology to known GPCR sequences (See page 11, line 12 – page 16, line 24; Tables 1C-1H). The instant specification does not teach any physiologic ligands or functional characteristics of the GPCR set forth in SEQ ID NO:2 or encoded by the disclosed nucleic acid

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set forth in SEQ ID NO:1. There is no well-established utility for a specific nucleic acid or amino acid sequence and the specification fails to disclose a specific and substantial utility for the claimed invention.

11. The specification asserts the following as patentable utilities for the claimed DNA (SEQ ID NO:1) encoding the receptor protein of SEQ ID NO:2:

- 1) as hybridization probes and PCR primers (pg 17, lines 24-27);
- 2) recombinant production of the encoded protein (pg 50, lines 26-32);
- 3) production of transgenic non-human animals (pg 54, line 9 – pg 56, line 34);
- 4) gene therapy vectors (pg 60, lines 4-12);
- 5) chromosome mapping (pg 67, line 2 – pg 68, line 31);
- 6) tissue typing and forensic identification (pg 68, line 32 – pg 69, line 26);
- 7) prognostic assays (pg 72, line 5 – page 77, line 11);
- 8) diagnostic assays (pg 70, line 23 – pg 72, line 3);
- 9) pharmacogenomics (pg 77, line 13 – pg 78, line 35);
- 10) methods of monitoring treatment (pg 79, line 1 – pg 80, line 8); and
- 11) prophylactic and/or therapeutic agents for various diseases (pg 80, lines 10-21)

12. These asserted utilities are neither specific nor substantial because they do not identify or reasonably confirm a “real world” context of use. The specification neither identifies the biological functions of the claimed protein and DNA, nor any diseases that are associated with the claimed molecules. Without any biological activity or link to a disease, such constitutes further research to determine the properties of the claimed GPCR protein or partial peptides, which is insufficient to meet the requirement of 35 USC § 101.

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13. These activities and functions are conjectural and are based solely on the identification of the putative protein of SEQ ID NO:2 as being a G-protein coupled receptor (GPCR). While it is credible that SEQ ID NO:2 is a GPCR, its identification as such is not sufficient to establish either a well known, or a specific, substantial and credible utility. There is no ligand identified that binds to it, no signaling pathway with which it is involved, and no disease or disorder correlated with the polypeptide. In Tables 3-5 it is disclosed that the nucleic acid is expressed in a variety of cell lines and tissues. The Specification discloses that the nucleic acid is down-regulated in the temporal cortex of Alzheimer's disease patients (See pg 16, lines 40-43). Contrary to this assertion, the results presented in Table 3 demonstrate that the expression in the temporal cortex of Alzheimer's disease patients ranges from 2.9-39% compared to controls, while expression in the temporal cortex of normal patients ranges from 1.5-51.4% compared to controls. The specification further asserts that the gene is largely restricted to normal tissues including ovary, uterus, kidney, colon, as well as in a sample from malignant kidney and therefore modulation of this gene might be beneficial for the treatment of kidney cancer (See pg 101, lines 4-10; Table 4). Lastly, the specification asserts, based on gene expression, that the nucleic acid of SEQ ID NO:1 may be important for T-cell polarization and that regulation of the transcript may be important in immune modulation and T-cell-mediated disorders such as asthma, arthritis, psoriasis, IBD, and lupus (See pg 101, lines 11-21; Table 5). The Instant Application has not provided sufficient experimental data to establish a nexus between the expression of the nucleic acid of SEQ ID NO:1 and any disease or disorder. Since the instant specification does not disclose how to use the polypeptide of SEQ ID NO:2, a skilled artisan would not know how to use nucleic acids of SEQ ID NO:1 that encode the polypeptide.

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14. The art teaches that the GPCR family is extremely diverse, and that function cannot be predicted merely by identifying a protein as a GPCR. For example, Ji et al., in the Journal of Biological Chemistry 273(28): 17299-17302, teach that there have been nearly 2000 GPCR's reported, which are classifiable into 100 sub families according to sequence homology, ligand structure and receptor function. They further teach that different GPCR superfamily members are capable of sending signals via alternative signal molecules such as Jak2, phospholipase C, or protein kinase C, and that there are other seven transmembrane domain molecules that are not coupled to G proteins at all. Marchese et al. (Genomics 29:335), teach that IL-8 receptor, neuropeptide Y receptor and Somatostatin receptors are all GPCR's. Thus, although the homology of the GPCR family, especially in the transmembrane domain regions, allows identification of such as GPCRs, mere homology and quantification of gene expression is not accepted by those of skill in the art as being predictive of function. Utility must be in readily available form. It is possible that, after further characterization, this protein might be found to have a patentable utility, in which case proteins would have a specific utility, or the protein might be found to be associated with a specific disease.

15. In *Brenner v. Manson*, 148 U.S.P.Q. 689 (Sup. Ct., 1966), a process of producing a novel compound that was structurally analogous to other compounds which were known to possess anti-cancer activity was alleged to be useful because the compound produced thereby was potentially useful as an anti-tumor agent in the absence of evidence supporting this utility. The court expressed the opinion that all chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation. However, the court held that this broad interpretation was not the intended definition of "useful" as it appears in 35 U.S.C. § 101, which

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requires that an invention must have either an immediately obvious or fully disclosed “real world” utility. The instant claims are drawn to a protein which has undetermined function or biological significance. Until some actual and specific activity or significance can be attributed to the protein identified in the specification as SEQ ID NO:2 or the polynucleotide encoding it (SEQ ID NO:1), the claimed invention is incomplete.

16. Claims 5, 8-10, 12-14, 39, and 42 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific, substantial and credible asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to make/use the claimed invention.

17. Furthermore, even if the protein of SEQ ID NO:2 or the DNA of SEQ ID NO:1 that encodes SEQ ID NO:2 were to have a patentable utility, the instant disclosure would not be found to be enabling for the full scope of the claimed invention.

18. Claim 5 recites a polynucleotide that encodes a polypeptide comprising an amino acid sequence of SEQ ID NO:2 (See 112¶2 rejection below) or complements thereof, claim 8 recites a nucleic acid sequence selected from the group consisting of SEQ ID NO:1 (See 112¶2 rejection below), and claim 10 recites a polynucleotide that hybridizes under stringent conditions (See 112¶2 rejection below) to the polynucleotide of SEQ ID NO:1 and complements thereof. However, other than the protein of SEQ ID NO:2 and the DNA of SEQ ID NO:1 that encodes the protein, the disclosure fails to provide sufficient guidance and information regarding the structural and functional requirements commensurate in scope with what is encompassed by the



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instant claims. The disclosure has not shown (1) which portions of SEQ ID NO:2 or SEQ ID NO:1 are critical to the activity of the protein of SEQ ID NO:2 (which is itself unknown); (2) what modifications (e.g., substitutions, deletions, or additions) one can make to SEQ ID NO:2 that will result in protein mutants with the same activity as the protein of SEQ ID NO:2; and (3) any guidance on how to use peptides of SEQ ID NO:2 which would, based on the language of said claims, encompass both active and inactive variants of SEQ ID NO:2. The state of the art is such that the relationship between the sequence of a protein and its activity is not well understood and unpredictable, and that certain positions in the sequence are critical to the protein's structure/function relationship and can only tolerate only relatively conservative substitutions or no substitutions (See Wells, 1990, *Biochemistry* 29:8509-8517; Ngo et al., *The Protein Folding Problem and Tertiary Structure Prediction*, 1994, pp. 492-495).

19. Furthermore, even if the nucleic acid of SEQ ID NO:1 was enabled, the instant disclosure would not be found to be enabling for a pharmaceutical composition comprising the nucleic acid. Since the Instant Specification has not disclosed any disease or disorder correlated with the expression of SEQ ID NO:1 or the protein encoded by it, a skilled artisan would not know how to use a pharmaceutical composition comprising the nucleic acid of SEQ ID NO:1. With respect to this aspect of the rejection, amendment to the claim to read "A composition comprising the nucleic acid molecule of claim 5 and a pharmaceutically-acceptable carrier." would be remedial with respect to this particular issue.

19. Due to the large quantity of experimentation necessary to generate the infinite number of derivatives recited in the claims, the lack of direction/guidance presented in the specification regarding which structural features are required in order to provide activity, the absence of

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working examples directed to the same, the complex nature of the invention, the state of the prior art which establishes the unpredictability of the effects of substitutions/deletions on protein structure and function, and the breadth of the claims which fail to recite any structural or functional limitations, undue experimentation would be required of the skilled artisan to make and/or use the claimed invention in its full scope, even if the nucleic acid of SEQ ID NO:1 were found to be enabled.

***Claim Rejections - 35 USC § 112, 2<sup>nd</sup> paragraph***

20. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

21. Claims 5, 8-10, 12-14, 39, and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

22. Claim 5 is indefinite because it recites the term “mature form”. Since neither the art nor the specification provides an unambiguous definition of the term, the metes and bounds of the claim cannot be determined.

23. Claim 5 is further indefinite for reciting “an amino acid sequence of SEQ ID NO:2” in part (a) and (b) of the claim. Without knowing whether the indefinite article “an” is intended to mean “the amino acid sequence of SEQ ID NO:2” or any portion of the amino acid set forth as SEQ ID NO:2, the metes and bounds of the claim cannot be determined.

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24. Claims 5 and 10 are indefinite because the metes and bounds of the term “complement” are not clear from the prior art or the Specification. It is not clear if a full-length or partial complement is intended.

25. Claim 8 is indefinite because the metes and bounds of the phrase “selected from the group consisting of SEQ ID NO:1” cannot be determined. It is not clear if multiple sequences, i.e., fragments, are encompassed by this phrase. Amendment to the claim to read “The nucleic acid molecule of claim 5, wherein the nucleic acid molecule differs by a single nucleotide from the nucleic acid sequence of SEQ ID NO:1”, or the like, would be remedial.

26. Claim 10 is further indefinite because it is unclear if the “complement” refers to a complement of SEQ ID NO:1 or a complement of a nucleic acid that hybridizes under stringent conditions to SEQ ID NO:1.

27. Claim 10 is further indefinite as there is no limiting definition of stringent hybridization conditions in the Specification, and the metes and bounds of that which will hybridize are dependent upon the conditions under which the hybridization is performed. The discussion of such at page 18 of the Specification is noted but vague, fails to breathe life and meaning into the term, is exemplary rather than limiting, and thus is insufficient to render the claim definite.

28. Claims 9, 12-14, 39, and 42 depend, either directly or indirectly, from claim 5.

#### ***Claim Rejections - 35 USC § 102***

29. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

30. Claims 5, 8-10, 12-14, 39, and 42 are rejected under 35 U.S.C. 102(e) as being anticipated by Lal et al. (US 2003/0119111 A1, published on 26 June 2003; priority date, 20 March 2000).

31. Lal et al. teach a polynucleotide (SEQ ID NO:29) that encodes a G-protein coupled receptor set forth as SEQ ID NO:18. It is noted that the terms "comprising a nucleic acid sequence" encoding a polypeptide "comprising an amino acid sequence", for example, as recited in the claims is open language and thus the claims read on the polynucleotide taught by Lal et al. (See also 112 ¶2 rejections *supra*). The polynucleotide set forth as SEQ ID NO:29 also comprises a fragment (nucleotides 807-926) that shares 100% sequence identity with nucleotides 826-945 of SEQ ID NO:1 of the Instant Application, that encodes a protein that shares 100% sequence identity with amino acid residues 52-108 of SEQ ID NO:2 of the Instant Application (See attached Sequence Alignments). The polynucleotide set forth as SEQ ID NO:29, which is 84% identical to SEQ ID NO:1, would also hybridize to SEQ ID NO:1 under stringent conditions. Lal et al. also teach the nucleic acids also include fragments and complements of SEQ ID NO:29 (See pg 3, ¶0023 and pg 7, ¶0065). Lal et al. also teach a vector and a host cell comprising the polynucleotides of SEQ ID NO:29 operably linked to a promoter, and a method

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of producing the receptor protein or fragments thereof (See pg 14, ¶0151 – pg 16, ¶0166). Lastly, Lal et al. teach pharmaceutical compositions comprising the nucleic acids (See pg 23, ¶0212), which by necessity would be in a container. Thus, the reference of Lal et al. meets all the limitations of claims 5, 8-10, 12-14, 39, and 42.

### *Summary*

32. No claim is allowed.

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Waterston, GenBank Accession. No. AC027641 (07 July 2000), discloses a genomic sequence that comprises a nucleic acid sequence that shares 99.9% sequence identity to SEQ ID NO:1. It is here made of record but not used in the art rejection as one would not reasonably expect the genomic sequence to encode the amino acid sequence of SEQ ID NO:2 of the Instant Application because there is a 1 nucleotide change that would produce a frame-shift (See attached sequence alignment).

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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jon M. Lockard, Ph.D.** whose telephone number is **(571) 272-2717**. The examiner can normally be reached on Monday through Friday, 8:00 AM to 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Brenda Brumback, Ph.D.** can be reached on **(571) 272-0961**.

The fax number for the organization where this application or proceeding is assigned is **703-872-9306**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).

JML  
December 6, 2004

A handwritten signature in cursive script that reads "Lorraine Spector". The signature is written in black ink and is positioned above the printed name and title.

LORRAINE SPECTOR  
PRIMARY EXAMINER

Sequence Alignments

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RESULT 13
US-10-343-650A-513
; Sequence 513, Application US/10343650A
; Publication No. US20040067499A1
; GENERAL INFORMATION:
; APPLICANT: HAGA, TATSUYA
; TITLE OF INVENTION: NOVEL G-PROTEIN COUPLED RECEPTOR
; FILE REFERENCE: 31671-186347
; CURRENT APPLICATION NUMBER: US/10/343,650A
; CURRENT FILING DATE: 2003-07-21
; PRIOR APPLICATION NUMBER: JP 2000/237818
; PRIOR FILING DATE: 2000-08-04
; PRIOR APPLICATION NUMBER: JP 2001/34434
; PRIOR FILING DATE: 2001-02-13
; NUMBER OF SEQ ID NOS: 594
; SOFTWARE: PatentIn Ver. 2.1
; SEQ ID NO: 513
; LENGTH: 951
; TYPE: DNA
; ORGANISM: Homo sapiens
; FEATURE:
; NAME/KEY: GDS
; LOCATION: (1)..(951)
US-10-343-650A-513

Query Match      83.9%; Score 819.8; DB 13; Length 951;
Best Local Similarity 91.4%; Pred. No. 1.4e-263;
Matches 869; Conservative 0; Mismatches 82; Indels 0; Gaps 0;

QY 20 ATGGAGCTCCGGAACCTCCACCTGGGAGCGGCTTCATCTGGTGGGGATCTGAAATGAC 79
DB 1 ATGGAGCTCCGGAACCTCCACCTGGGAGCGGCTTCATCTGGTGGGGATCTGAAATGAC 60
QY 80 ATGGGCTTCCTGAATCTGCTATGCTATGCTAATTAATTAATTAATTAATTAATTAAT 139
DB 61 ATGGGCTTCCTGAATCTGCTATGCTAATTAATTAATTAATTAATTAATTAATTAAT 120
QY 140 AGCAATGGTCTCTGCTCTCTGCTGCTATGCTATGCTATGCTATGCTATGCTATGCT 199
DB 121 AGCAATGGTCTCTGCTCTCTGCTGCTATGCTATGCTATGCTATGCTATGCTATGCT 180
QY 200 CTCCTGCTGGGACCTCTCTCTCTGCTATGCTATGCTATGCTATGCTATGCTATGCTAT 259
DB 181 CTCCTGCTGGGACCTCTCTCTCTGCTATGCTATGCTATGCTATGCTATGCTATGCTAT 240
QY 260 GCTTGGGCGGACTTCTTCGGAGAGAAACATATCTCTTGGAGGCTGTGCACTTCAG 319
DB 241 GCTTGGGCGGACTTCTTCGGAGAGAAACATATCTCTTGGAGGCTGTGCACTTCAG 300
QY 320 ATGTTCTTGGGCACTGCAATAGGTAAGGCTGAGGACCTCTCTCTGCTATGCTATGCTAT 379
DB 301 ATGTTCTTGGGCACTGCAATAGGTAAGGCTGAGGACCTCTCTCTGCTATGCTATGCTAT 360
QY 380 GACAGGTATGTGGCACTTGTCACTCTCTGAAATACATGACCTCTGAGGCGGCAAGATC 439
DB 361 GACAGGTATGTGGCACTTGTCTCTCTGAAATACATGACCTCTGAGGCGGCAAGATC 420
QY 440 TGTGGAATCATGTTGGGCAATCTCTGGAATCTCTGGAATCTCTGGAATCTCTGGAATC 499
DB 421 TGTGGAATCATGTTGGGCAATCTCTGGAATCTCTGGAATCTCTGGAATCTCTGGAATC 480
QY 500 ATGTACACTATGACCTCTCTCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 559
DB 481 ATGTACACTATGACCTCTCTCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 540
QY 560 ATCCCAACCTTGTGAAGTGGGCTGTGCTGATATCTCCAGGTATGAGCTTATATATATAC 619
DB 541 ATCCCAACCTTGTGAAGTGGGCTGTGCTGATATCTCCAGGTATGAGCTTATATATATAC 600
QY 620 GTGACAGGTGCTATTTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCT 679
DB 601 GTGACAGGTGCTATTTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCT 660

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RESULT 14
US-10-220-382-39
; Sequence 39, Application US/10220382
; Publication No. US2003011911A1
; GENERAL INFORMATION:
; APPLICANT: INCYTE GENOMICS, INC.
; APPLICANT: LAL, Preeti
; APPLICANT: TANG, Y. Tom
; APPLICANT: PATTERSON, Chandra
; APPLICANT: YAO, Monique G.
; APPLICANT: SHIH, Leo L.
; APPLICANT: TRIBOULET, Catherine
; APPLICANT: LU, Dying Aina M.
; APPLICANT: YUE, Henry
; APPLICANT: KHAN, Farrah A.
; APPLICANT: POLICKY, Jennifer L.
; APPLICANT: AU-YOUNG, Janice
; APPLICANT: YANG, Junming
; APPLICANT: HARLAND, Lee
; APPLICANT: WALSH, Roderick T.
; APPLICANT: LO, Terence P.
; APPLICANT: BOROWSKY, Mark L.
; TITLE OF INVENTION: G-PROTEIN COUPLED RECEPTORS
; FILE REFERENCE: PI-0044 PCT
; CURRENT APPLICATION NUMBER: US/10/220,382
; CURRENT FILING DATE: 2001-03-01
; PRIOR APPLICATION NUMBER: 60/186,854; 60/188,384; 60/190,453; 60/190,730
; PRIOR FILING DATE: 2000-03-03; 2000-03-10; 2000-03-17; 2000-03-20
; NUMBER OF SEQ ID NOS: 42
; SOFTWARE: PERL Program
; SEQ ID NO: 39
; LENGTH: 951
; TYPE: DNA
; ORGANISM: Homo sapiens
; FEATURE:
; NAME/KEY: misc feature
; OTHER INFORMATION: Incyte ID No. US2003011911A1 7472445CB1
US-10-220-382-39

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Query Match      83.9%; Score 819.8; DB 15; Length 951;
Best Local Similarity 91.4%; Pred. No. 1.4e-263;
Matches 869; Conservative 0; Mismatches 82; Indels 0; Gaps 0;

QY 20 ATGAGCTCCGGAACCTCCACCTGGGAGCGGCTTCATCTGGTGGGGATCTGAAATGAC 79
DB 1 ATGAGCTCCGGAACCTCCACCTGGGAGCGGCTTCATCTGGTGGGGATCTGAAATGAC 60
QY 80 ATGGGCTTCCTGAATCTGCTATGCTAATTAATTAATTAATTAATTAATTAATTAAT 139
DB 61 ATGGGCTTCCTGAATCTGCTATGCTAATTAATTAATTAATTAATTAATTAATTAAT 120
QY 140 AGCAATGGTCTCTGCTCTCTGCTGCTATGCTATGCTATGCTATGCTATGCTATGCT 199

```

121 AGCAATGGCCCTACTGCTCTGGTATACCATGGAAGCCGGCTCCACATGCCATGTAC 180  
200 CTCCTGCTGGGAGCTCTCTCATGAGCCTCTCTGTCATCTGTCATCTGTCATCCAG 259  
181 CTCCTGCTGGGAGCTCTCTCATGAGCCTCTCTGTCATCTGTCATCTGTCATCCAG 240  
260 GCCTTGGGAGCTCTCTGTCAGAGAAACATCATCTCTGTCAGGCTGTCATCTGAG 319  
241 GCCTTGGGAGCTCTCTGTCAGAGAAACATCATCTCTGTCAGGCTGTCATCTGAG 300  
320 ATGCTCTGGCAGCTGTCATGAGCTGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 379  
301 ATGCTCTGGCAGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 360  
380 GACAGGTATGTCGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 439  
361 GACAGGTATGTCGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 420  
440 TGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 499  
421 TGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 480  
500 ATGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 559  
481 TGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 540  
560 ATGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 619  
541 ATGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 600  
620 GTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 679  
601 GTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 660  
680 GTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 739  
661 ATGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 720  
740 TGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 799  
721 TGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 780  
800 TTGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 859  
781 TTGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCT 840  
860 GTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 919  
841 GTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 900  
920 TTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 970  
901 TTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 951

RESULT 15  
US-10-000-846-25  
Sequence 25, Application US/10300846  
Publication No. US2003020737A1  
GENERAL INFORMATION:  
APPLICANT: ZHANG, YI  
APPLICANT: ZHANG, YI  
APPLICANT: ECHERRELLI, FERNANDO  
APPLICANT: WANG, KUN  
TITLE OF INVENTION: OLFACTORIC RECEPTORS FOR ISOVALERIC ACID AND RELATED  
TITLE OF INVENTION: MALODORANTS AND USE THEREOF IN ASSAYS FOR  
IDENTIFICATION OF BLOCKERS OF MALODOR  
FILE REFERENCES: 078003-0291924  
CURRENT APPLICATION NUMBER: US/10/300,846  
CURRENT FILING DATE: 2003-11-21  
PRIOR APPLICATION NUMBER: 00/348,371  
PRIOR FILING DATE: 2002-01-16

PRIOR APPLICATION NUMBER: 09/809,291  
PRIOR FILING DATE: 2001-03-13  
PRIOR APPLICATION NUMBER: 60/341,872  
PRIOR FILING DATE: 2001-12-21  
NUMBER OF SEQ ID NOS: 86  
SOFTWARE: PatentIn Ver. 2.1  
SEQ ID NO 25  
LENGTH: 951  
TYPE: DNA  
ORGANISM: Homo sapiens  
US-10-300-846-25

Query Match 83.9%; Score 819.8; DB 16; Length 951;  
Best Local Similarity 91.4%; Pred. No. 1.4e-263;  
Matches 869; Conservative 0; Mismatches 82; Indels 0; Gaps 0;

QY 20 ATGAGGCTCCGGAACCTCCACCTTGGGAAGCGGCTTCACTTGGTGGGATTTCTGAATGAC 79  
DB 1 ATGAGGCTCCGGAACCTCCACCTTGGGAAGCGGCTTCACTTGGTGGGATTTCTGAATGAC 60  
QY 80 AGTGGTCTCTGAACTGCTCTATGCTACATTTTAAATCTCTATACATGTTGGCACTGACC 139  
DB 61 AGTGGTCTCTGAACTGCTCTATGCTACATTTTAAATCTCTATACATGTTGGCCTGATC 120  
QY 140 AGCAATGCTCTGCTGCTCTGCTGCTCCTGAGGCTCACCATGAGGCGGCTCCACATGCCCATGTAC 199  
DB 121 AGCAATGCTCTGCTGCTCTGCTGCTCCTGAGGCTCACCATGAGGCGGCTCCACATGCCCATGTAC 180  
QY 200 CTCTGCTCTGAGGCTCTCTCTCATGAGGCTCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 259  
DB 181 CTCTGCTCTGAGGCTCTCTCTCATGAGGCTCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 240  
QY 260 GCCTTGGGAGCTTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 319  
DB 241 GCCTTGGGAGCTTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 300  
QY 320 ATGTTCTCTGAGGCTGAGGCTGAGGCTGAGGCTGAGGCTGAGGCTGAGGCTGAGGCTGAT 379  
DB 301 ATGTTCTCTGAGGCTGAGGCTGAGGCTGAGGCTGAGGCTGAGGCTGAGGCTGAGGCTGAT 360  
QY 380 GACAGGTATGTCGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 439  
DB 361 GACAGGTATGTCGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 420  
QY 440 TGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 499  
DB 421 TGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 480  
QY 500 ATGTAACATATGCACTCTCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 559  
DB 481 GTGTATACATGTCATCTCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 540  
QY 560 ATCCACCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 619  
DB 541 ATCCACCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 600  
QY 620 GTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 679  
DB 601 GTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 660  
QY 680 GTCTCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 739  
DB 661 ATCTGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 720  
QY 740 TGCTCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 799  
DB 721 TGCTCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 780  
QY 800 TTGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 859  
DB 781 TTGCTGATCATGTCGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCAT 840  
QY 860 GTGAGGCTGTCATCTCTGTCATGAGGCTGTCATGAGGCTGTCATGAGGCTGTCATGAG 919



QY 797 GTCTGCCCCAGTTCTTCCACAGCCCCAACAGCAACATCATCTCTGTTTCTACACA 856  
Db 660 GTCTGCCCCAGTTCTTCCACAGCCCCAACAGCAACATCATCTCTGTTTCTACACA 719  
QY 857 ATTGTCACCTCAGCCCTGAATCCACTCATCTACAGCTGAGGAATAAGAGGTCTATGCGG 916  
Db 720 ATTGTCACCTCAGCCCTGAATCCACTCATCTACAGCTGAGGAATAAGAGGTCTATGCGG 779  
QY 917 GCCTTGAGGAGGCTCTGCGGAAATACATCTGCTGGACATCTCCACGCTCTAGGGAAGG 976  
Db 780 GCCTTGAGGAGGCTCTGCGGAAATACATCTGCTGGACATCTCCACGCTCTAGGGAAGG 839  
QY 977 A 977  
Db 840 A 840

RESULT 4  
US-09-886-055-198  
; Sequence 198, Application US/09886055  
; Patent No. US20030132273A1  
; GENERAL INFORMATION:  
; APPLICANT: STRYER, LUBERT  
; APPLICANT: ZOZULYA, SERGEY  
; TITLE OF INVENTION: RECEPTOR FINGERPRINTING, SENSORY PERCEPTION, AND  
; TITLE OF INVENTION: BIOSENSORS OF CHEMICAL SENSANTS  
; FILE REFERENCE: 078003-0277150  
; CURRENT APPLICATION NUMBER: US/09/886,055  
; CURRENT FILING DATE: 2001-06-22  
; PRIOR APPLICATION NUMBER: 60/213,812  
; PRIOR FILING DATE: 2000-06-22  
; NUMBER OF SEQ ID NOS: 522  
; SOFTWARE: PatentIn Ver. 2.1  
; SEQ ID NO 198  
; LENGTH: 951  
; TYPE: DNA  
; ORGANISM: Homo sapiens  
US-09-886-055-198

Query Match 12.3%; Score 120; DB 9; Length 951;  
Best Local Similarity 100.0%; Pred. No. 2.2e-51;  
Matches 120; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
QY 826 ACAAGACACATCATCTCTGTTTCTACACAATTGTCTACTCCAGCCCTGAATCCACTCAT 885  
Db 807 ACAAGACACATCATCTCTGTTTCTACACAATTGTCTACTCCAGCCCTGAATCCACTCAT 866  
QY 886 CTACAGCCTGAGGAATAAGAGGTCTATGCGGAAATACAT 945  
Db 867 CTACAGCCTGAGGAATAAGAGGTCTATGCGGAAATACAT 926

RESULT 4  
US-09-804-291-198  
; Sequence 198, Application US/09804291  
; Publication No. US20030088059A1  
; GENERAL INFORMATION:  
; APPLICANT: ZOZULYA, SERGEY  
; TITLE OF INVENTION: HUMAN OLFACTORY RECEPTORS AND GENES ENCODING SAME  
; FILE REFERENCE: P 0278005  
; CURRENT APPLICATION NUMBER: US/09/804,291  
; CURRENT FILING DATE: 2001-03-13  
; PRIOR APPLICATION NUMBER: 60/188,914  
; PRIOR FILING DATE: 2000-03-13  
; PRIOR APPLICATION NUMBER: 60/192,033  
; PRIOR FILING DATE: 2000-03-24  
; PRIOR APPLICATION NUMBER: 60/198,474  
; PRIOR FILING DATE: 2000-04-14  
; PRIOR APPLICATION NUMBER: 60/199,335  
; PRIOR FILING DATE: 2000-04-24  
; PRIOR APPLICATION NUMBER: 60/207,702  
; PRIOR FILING DATE: 2000-05-05  
; PRIOR APPLICATION NUMBER: 60/213,849

PRIOR FILING DATE: 2000-06-23  
PRIOR APPLICATION NUMBER: 60/226,534  
PRIOR FILING DATE: 2000-08-16  
PRIOR APPLICATION NUMBER: 60/230,732  
PRIOR FILING DATE: 2000-09-07  
PRIOR APPLICATION NUMBER: 60/266,862  
PRIOR FILING DATE: 2001-02-07  
NUMBER OF SEQ ID NOS: 529  
SOFTWARE: PatentIn Ver. 2.1  
SEQ ID NO 198  
LENGTH: 951  
TYPE: DNA  
ORGANISM: Homo sapiens  
US-09-804-291-198

Query Match 12.3%; Score 120; DB 10; Length 951;  
Best Local Similarity 100.0%; Pred. No. 2.2e-51;  
Matches 120; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
QY 826 ACAAGACACATCATCTCTGTTTCTACACAATTGTCTACTCCAGCCCTGAATCCACTCAT 885  
Db 807 ACAAGACACATCATCTCTGTTTCTACACAATTGTCTACTCCAGCCCTGAATCCACTCAT 866  
QY 886 CTACAGCCTGAGGAATAAGAGGTCTATGCGGAAATACAT 945  
Db 867 CTACAGCCTGAGGAATAAGAGGTCTATGCGGAAATACAT 926

RESULT 5  
US-10-343-650A-513  
; Sequence 513, Application US/10343650A  
; Publication No. US20040067499A1  
; GENERAL INFORMATION:  
; APPLICANT: HAGA, TATSUYA  
; TITLE OF INVENTION: NOVEL G-PROTEIN COUPLED RECEPTOR  
; FILE REFERENCE: 31671-186347  
; CURRENT APPLICATION NUMBER: US/10/343,650A  
; CURRENT FILING DATE: 2003-07-21  
; PRIOR APPLICATION NUMBER: JP 2000/237818  
; PRIOR FILING DATE: 2000-08-04  
; PRIOR APPLICATION NUMBER: JP 2001/34434  
; PRIOR FILING DATE: 2001-02-13  
; NUMBER OF SEQ ID NOS: 694  
; SOFTWARE: PatentIn Ver. 2.1  
; SEQ ID NO 513  
; LENGTH: 951  
; TYPE: DNA  
; ORGANISM: Homo sapiens  
; FEATURE:  
; NAME/KEY: CDS  
; LOCATION: (1)..(951)  
US-10-343-650A-513

Query Match 12.3%; Score 120; DB 13; Length 951;  
Best Local Similarity 100.0%; Pred. No. 2.2e-51;  
Matches 120; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
QY 826 ACAAGACACATCATCTCTGTTTCTACACAATTGTCTACTCCAGCCCTGAATCCACTCAT 885  
Db 807 ACAAGACACATCATCTCTGTTTCTACACAATTGTCTACTCCAGCCCTGAATCCACTCAT 866  
QY 886 CTACAGCCTGAGGAATAAGAGGTCTATGCGGAAATACAT 945  
Db 867 CTACAGCCTGAGGAATAAGAGGTCTATGCGGAAATACAT 926

RESULT 6  
US-10-220-382-39  
; Sequence 39, Application US/10220382  
; Publication No. US2003011911A1  
; GENERAL INFORMATION:  
; APPLICANT: INCYTE GENOMICS, INC.  
; APPLICANT: LAL, Preeti

APPLICANT: TANG, Y. Tom  
APPLICANT: PATTERSON, Chandra  
APPLICANT: YAO, Monique G.  
APPLICANT: SHIH, Leo L.  
APPLICANT: TRIBOULEY, Catherine  
APPLICANT: LU, Dyung Aina M.  
APPLICANT: YUE, Henry  
APPLICANT: KHAN, Farrah A.  
APPLICANT: POLICKY, Jennifer L.  
APPLICANT: AU-YOUNG, Janice  
APPLICANT: YANG, Junming  
APPLICANT: HARLAND, Lee  
APPLICANT: WALSH, Roderick T.  
APPLICANT: LO, Terence P.  
APPLICANT: BOROWSKI, Mark L.  
TITLE OF INVENTION: G-PROTEIN COUPLED RECEPTORS  
FILE REFERENCE: PI-0044 PCT  
CURRENT APPLICATION NUMBER: US/10/220,382  
CURRENT FILING DATE: 2001-03-01  
PRIOR APPLICATION NUMBER: 60/186,854; 60/190,453; 60/190,730  
PRIOR FILING DATE: 2000-03-03; 2000-03-10; 2000-03-17; 2000-03-20  
NUMBER OF SEQ ID NOS: 42  
SOFTWARE: PERL Program  
SEQ ID NO 39  
LENGTH: 951  
TYPE: DNA  
ORGANISM: Homo sapiens  
FEATURE:  
NAME/KEY: misc feature  
OTHER INFORMATION: Incyte ID No. US20030119111A1 7472446CB1  
US-10-220-382-39

Query Match 12.3%; Score 120; DB 15; Length 951;  
Best Local Similarity 100.0%; Pred. No. 2.2e-51;  
Matches 120; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 826 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 885  
DB 807 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 866  
QY 886 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 945  
DB 867 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 926

RESULT 7  
US-10-300-846-25  
Sequence 25, Application US/10300846  
Publication No. US20030207337A1  
GENERAL INFORMATION:  
APPLICANT: HAN, YI  
APPLICANT: ZOZULYA, SERGEY  
APPLICANT: ECHEVERRI, FERNANDO  
APPLICANT: WANG, KUN  
TITLE OF INVENTION: OLFACTORY RECEPTORS FOR ISOVALERIC ACID AND RELATED  
TITLE OF INVENTION: MALODORANTS AND USE THEREOF IN ASSAYS FOR  
TITLE OF INVENTION: IDENTIFICATION OF BLOCKERS OF MALODOR  
FILE REFERENCE: 078003-0291924  
CURRENT APPLICATION NUMBER: US/10/300,846  
CURRENT FILING DATE: 2002-11-21  
PRIOR APPLICATION NUMBER: 60/348,371  
PRIOR FILING DATE: 2002-01-16  
PRIOR APPLICATION NUMBER: 09/809,291  
PRIOR FILING DATE: 2001-03-13  
PRIOR APPLICATION NUMBER: 60/341,872  
PRIOR FILING DATE: 2001-12-21  
NUMBER OF SEQ ID NOS: 86  
SOFTWARE: PatentIn Ver. 2.1  
SEQ ID NO 25  
LENGTH: 951  
TYPE: DNA  
ORGANISM: Homo sapiens  
US-10-300-846-25

Query Match 12.3%; Score 120; DB 15; Length 951;  
Best Local Similarity 100.0%; Pred. No. 2.2e-51;  
Matches 120; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 826 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 885  
DB 807 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 866  
QY 886 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 945  
DB 867 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 926

Query Match 12.3%; Score 120; DB 16; Length 951;  
Best Local Similarity 100.0%; Pred. No. 2.2e-51;  
Matches 120; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 826 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 885  
DB 807 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 866  
QY 886 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 945  
DB 867 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 926

RESULT 8  
US-09-974-591-11  
Sequence 11, Application US/09974591  
Publication No. US20030059830A1  
GENERAL INFORMATION:  
APPLICANT: Alsobrook II, John P  
APPLICANT: Burgess, Catherine E  
APPLICANT: Grose, William M  
APPLICANT: Lepley, Denise M  
APPLICANT: Padigaru, Muralidhara  
APPLICANT: Spytak, Kimberly A  
TITLE OF INVENTION: No. US20030059830A1 Single Nucleotide Polymorphisms for Olfact  
TITLE OF INVENTION: Receptor-like Polypeptides and Nucleic Acids Encoding  
TITLE OF INVENTION: the Same  
FILE REFERENCE: 15966-654 CIP  
CURRENT APPLICATION NUMBER: US/09/974,591  
CURRENT FILING DATE: 2001-10-09  
PRIOR APPLICATION NUMBER: 60/245,292  
PRIOR FILING DATE: 2000-11-02  
NUMBER OF SEQ ID NOS: 26  
SOFTWARE: PatentIn Ver. 2.1  
SEQ ID NO 11  
LENGTH: 1008  
TYPE: DNA  
ORGANISM: Homo sapiens  
FEATURE:  
NAME/KEY: CDS  
LOCATION: (27) .. (998)  
US-09-974-591-11

Query Match 12.3%; Score 120; DB 10; Length 1008;  
Best Local Similarity 100.0%; Pred. No. 2.2e-51;  
Matches 120; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 826 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 885  
DB 857 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 916  
QY 886 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 945  
DB 917 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 976

RESULT 9  
US-09-974-591-13  
Sequence 13, Application US/09974591  
Publication No. US20030059830A1  
GENERAL INFORMATION:  
APPLICANT: Alsobrook II, John P  
APPLICANT: Burgess, Catherine E  
APPLICANT: Grose, William M  
APPLICANT: Lepley, Denise M  
APPLICANT: Padigaru, Muralidhara  
APPLICANT: Spytak, Kimberly A  
TITLE OF INVENTION: No. US20030059830A1 Single Nucleotide Polymorphisms for Olfact  
TITLE OF INVENTION: Receptor-like Polypeptides and Nucleic Acids Encoding  
TITLE OF INVENTION: the Same  
FILE REFERENCE: 15966-654 CIP  
CURRENT APPLICATION NUMBER: US/09/974,591

Query Match 12.3%; Score 120; DB 10; Length 1008;  
Best Local Similarity 100.0%; Pred. No. 2.2e-51;  
Matches 120; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 826 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 885  
DB 857 ACAAGACATCATCTCTGTTTCTACACATTTGCTACAGCCCTGGAATCCACTCAT 916  
QY 886 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 945  
DB 917 CTACAGCCTGAGGAATAAGGAGTCTATGCGGCCCTTGAGGAGGCTCTGGGAAATACAT 976

US-10-343-650A-514  
; Sequence 514, Application US/10343650A  
; Publication No. US20040067499A1  
; GENERAL INFORMATION:  
; APPLICANT: HAGA, TATSUYA  
; TITLE OF INVENTION: NOVEL G-PROTEIN COUPLED RECEPTOR  
; FILE REFERENCE: 31671-186347  
; CURRENT APPLICATION NUMBER: US/10/343,650A  
; PRIOR FILING DATE: 2003-07-21  
; PRIOR FILING DATE: 2000-08-04  
; PRIOR FILING DATE: 2000-08-04  
; PRIOR FILING DATE: 2001-02-13  
; NUMBER OF SEQ ID NOS: 694  
; SOFTWARE: PatentIn Ver. 2.1  
; SEQ ID NO 514  
; LENGTH: 316  
; TYPE: PRT  
; ORGANISM: Homo sapiens  
US-10-343-650A-514

Query Match 18.0%; Score 57; DB 12; Length 316;  
Best Local Similarity 100.0%; Pred. No. 3.3e-44;  
Matches 57; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 52 EARLHMPMYLLGQLSLMDLLFTSVVTPKALADFLRENTISFGGCAQMFALTMG 108  
DB 52 EARLHMPMYLLGQLSLMDLLFTSVVTPKALADFLRENTISFGGCAQMFALTMG 108

\* RESULT 9

US-10-220-382-18  
; Sequence 18, Application US/10220382  
; Publication No. US2003011911A1  
; GENERAL INFORMATION:  
; APPLICANT: INCYTE GENOMICS, INC.  
; APPLICANT: LAL, Preeti  
; APPLICANT: TANG, Y. Tom  
; APPLICANT: PATTERSON, Chandra  
; APPLICANT: YAO, Monique G.  
; APPLICANT: SHIH, Leo L.  
; APPLICANT: TRIBOULEY, Catherine  
; APPLICANT: LU, Dying Aina M.  
; APPLICANT: YUE, Henry  
; APPLICANT: KHAN, Farrah A.  
; APPLICANT: POLICKY, Jennifer L.  
; APPLICANT: AU-YOUNG, Janice  
; APPLICANT: YANG, Junming  
; APPLICANT: HARLAND, Lee  
; APPLICANT: WALSH, Roderick T.  
; APPLICANT: LO, Terence P.  
; APPLICANT: BOROMSKY, Mark L.  
; TITLE OF INVENTION: G-PROTEIN COUPLED RECEPTORS  
; FILE REFERENCE: PT-0044 PCT  
; CURRENT APPLICATION NUMBER: US/10/220,382  
; CURRENT FILING DATE: 2001-03-01  
; PRIOR APPLICATION NUMBER: 60/186,854; 60/186,384; 60/190,453; 60/190,730  
; PRIOR FILING DATE: 2000-03-03; 2000-03-10; 2000-03-17; 2000-03-20  
; NUMBER OF SEQ ID NOS: 42  
; SOFTWARE: PERL Program  
; SEQ ID NO 18  
; LENGTH: 316  
; TYPE: PRT  
; ORGANISM: Homo sapiens  
; NAME/KEY: misc feature  
; OTHER INFORMATION: Incyte ID No. US2003011911A1 7472446CD1  
US-10-220-382-18

Query Match 18.0%; Score 57; DB 14; Length 316;  
Best Local Similarity 100.0%; Pred. No. 3.3e-44;  
Matches 57; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 52 EARLHMPMYLLGQLSLMDLLFTSVVTPKALADFLRENTISFGGCAQMFALTMG 108  
DB 52 EARLHMPMYLLGQLSLMDLLFTSVVTPKALADFLRENTISFGGCAQMFALTMG 108

RESULT 10

US-10-017-161-310  
; Sequence 310, Application US/10017161  
; Publication No. US20030143668A1  
; GENERAL INFORMATION:  
; APPLICANT: SUWA, MAKIKO  
; APPLICANT: ASAI, KIYOSHI  
; APPLICANT: AKIYAMA, YUTAKA  
; APPLICANT: ABURATANI, HIROYUKI  
; TITLE OF INVENTION: NOVEL G PROTEIN-COUPLED RECEPTORS  
; FILE REFERENCE: 084335/0152  
; CURRENT APPLICATION NUMBER: US/10/017,161  
; CURRENT FILING DATE: 2002-12-18  
; PRIOR APPLICATION NUMBER: JP 2001/246789  
; PRIOR FILING DATE: 2001-06-18  
; NUMBER OF SEQ ID NOS: 2430  
; SOFTWARE: PatentIn Ver. 2.1  
; SEQ ID NO 310  
; LENGTH: 316  
; TYPE: PRT  
; ORGANISM: Homo sapiens  
US-10-017-161-310

Query Match 18.0%; Score 57; DB 14; Length 316;  
Best Local Similarity 100.0%; Pred. No. 3.3e-44;  
Matches 57; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 52 EARLHMPMYLLGQLSLMDLLFTSVVTPKALADFLRENTISFGGCAQMFALTMG 108  
DB 52 EARLHMPMYLLGQLSLMDLLFTSVVTPKALADFLRENTISFGGCAQMFALTMG 108

RESULT 11

US-10-024-444B-3  
; Sequence 3, Application US/1002444B  
; Publication No. US20030165858A1  
; GENERAL INFORMATION:  
; APPLICANT: Padigaru, Muralidhara  
; APPLICANT: Gerlach, Valerie L.  
; APPLICANT: Smithson, Glennda  
; APPLICANT: Stone, David  
; APPLICANT: Bin-Yang, Ruey  
; APPLICANT: Cooley, Pamela B.  
; APPLICANT: Hall, Matthew  
; APPLICANT: Tomlinson, James E.  
; APPLICANT: Toppet, James N.  
; APPLICANT: Kekuda, Ramesh  
; APPLICANT: Casman, Stacie J.  
; APPLICANT: MacDougall, John R.  
; APPLICANT: Shlomit, Edgar R.  
; TITLE OF INVENTION: Same  
; FILE REFERENCE: 21402-224 AS  
; CURRENT APPLICATION NUMBER: US/10/024,444B  
; CURRENT FILING DATE: 2002-12-19  
; PRIOR APPLICATION NUMBER: 60/238,635  
; PRIOR FILING DATE: 2000-12-18  
; NUMBER OF SEQ ID NOS: 12  
; SOFTWARE: PatentIn Ver. 2.1  
; SEQ ID NO 3  
; LENGTH: 316  
; TYPE: PRT  
; ORGANISM: human  
US-10-024-444B-3

Query Match 18.0%; Score 57; DB 14; Length 316;  
Best Local Similarity 100.0%; Pred. No. 3.3e-44;  
Matches 57; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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Db 601 CCTCATGAGCCCAAGAGTCTGCTGGATCATGGTGGCCACATCCCTGGATCCTGGCATCCCT 660
QY 481 GATTGCTATAGGACATACCATGATGATACATATGCACTCCCTTTCTGTGTGCTCTGGGAAAT 540
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QY 541 CAGGCATCTGCTGTGAGATCCACCTTGCTGAGTGGCCGCTGCTGATACCTCCAG 600
Db 721 CAGGCATCTGCTGTGAGATCCACCTTGCTGAGTGGCCGCTGCTGATACCTCCAG 780
QY 601 GTATGAGCTTATATATACGTGACAGGTGATGACTTTCTCTGTGCTCCCATTTCTGTCAT 660
Db 781 GTATGAGCTTATATATACGTGACAGGTGATGACTTTCTCTGTGCTCCCATTTCTGTCAT 840
QY 661 TGTGGCTCTTACACACATGATGCTTATTCACGTGCTGCTGATGCTGATGCTGATGCTGATGCT 720
Db 841 TGTGGCTCTTACACACATGATGCTTATTCACGTGCTGCTGATGCTGATGCTGATGCTGATGCT 900
QY 721 GAAGAAAGCCCTTGTGATCTGCTCTTCCACCTGATGCTGCTGCTGCTGCTGCTGCTGCTGCT 780
Db 901 GAAGAAAGCCCTTGTGATCTGCTCTTCCACCTGATGCTGCTGCTGCTGCTGCTGCTGCTGCT 960
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Db 961 TGCACATTCATGATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1020
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Db 1021 CTCTGTTTCTACACATTCATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1080
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Db 1081 TAAGAGGTGATGCGGCGCTTGAAGAGGCTCTGGGAAATACATATCTGCTGCGACATTC 1140
QY 961 CACGCTCTAGGAGGA 977
Db 1141 CACGCTCTAGGAGGA 1157

RESULT 4
AC027641/c
LOCUS 208430 bp DNA linear HTG 07-JUL-2000
DEFINITION Homo sapiens chromosome 11 clone RP11-732A19, WORKING DRAFT
SEQUENCE, 18 unordered pieces.
ACCESSION AC027641
VERSION AC027641.2 GI:8570385
KEYWORDS HTG; HTGS_PHASE1; HTGS_DRAFT.
SOURCE Homo sapiens (human)
ORGANISM Homo sapiens
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
1 (bases 1 to 208430)
Waterston,R.H.
The sequence of Homo sapiens clone
Unpublished
2 (bases 1 to 208430)
Waterston,R.H.
Direct Submission
Submitted (30-MAR-2000) Genome Sequencing Center, Washington
University School of Medicine, 4444 Forest Park Parkway, St. Louis,
MO 63108, USA
On Jun 17, 2000 this sequence version replaced gi:7344780.
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----- Genome Center -----
Center: Washington University Genome Sequencing Center
Center code: WUGSC
Web site: http://genome.wustl.edu/gsc/index.shtml
----- Project Information -----
Center project name: H.NH0732A19
----- Summary Statistics -----
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Sequencing vector: M13; 98%
Sequencing vector: plasmid; 2%
Chemistry: Dye-primer ET; 98% of reads
Chemistry: Dye-terminator Big Dye; 2% of reads
Assembly program: Phrap; version 0.990319
Consensus quality: 198825 bases at least Q40
Consensus quality: 202103 bases at least Q30
Consensus quality: 203934 bases at least Q20
Insert size: 219000; agarose-fp
Quality coverage: 4.27 in Q20 bases; agarose-fp
Quality coverage: 4.55 in Q20 bases; sum-of-contigs
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* NOTE: This is a 'working draft' sequence. It currently
* consists of 18 contigs. The true order of the pieces
* is not known and their order in this sequence record is
* arbitrary. Gaps between the contigs are represented as
* runs of N, but the exact sizes of the gaps are unknown.
* This record will be updated with the finished sequence
* as soon as it is available and the accession number will
* be preserved.
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1 1760: contig of 1760 bp in length
1761 1860: gap of unknown length
1861 3171: contig of 1311 bp in length
3172 5628: contig of 2357 bp in length
5629 7660: contig of 2032 bp in length
7661 15503: contig of 7843 bp in length
15504 18871: contig of 3268 bp in length
18872 22430: contig of 3459 bp in length
22431 28556: contig of 6026 bp in length
28557 35114: contig of 6758 bp in length
35115 42738: contig of 7224 bp in length
42739 50307: contig of 7469 bp in length
50308 62974: contig of 12567 bp in length
62975 73754: contig of 10679 bp in length
73755 87630: contig of 13777 bp in length
87631 106802: contig of 19072 bp in length
106803 120750: contig of 13748 bp in length
120751 156638: contig of 35887 bp in length
156639 208430: contig of 51693 bp in length.
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1861. 3171
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3272. 5628
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5729. 7760
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7861. 15503
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## FEATURES

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misc_feature
misc_feature
misc_feature
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| Qy           | 1            | GCAACTTAAAAACACATCATGGAGCTCCGGAACTCCACCTTGGGAAGCGCTTCATCTT  | 60  |  |
| Db           | 53629        | GCAACTTAAAAACACATCATGGAGCTCCGGAACTCCACCTTGGGAAGCGCTTCATCTT  | 52570   |  |
| Qy           | 61           | GGTGGGATTCTCAATGACAGTGGGCTCTCTGAACCTGCTCTATGCTACATTTTACAACTCCT  | 120   |  |
| Db           | 52569        | GGTGGGATTCTGAAATGACAGTGGGCTCTCTGAACCTGCTCTATGCTACATTTTACAACTCCT   | 52510   |  |
| Qy           | 121          | ATACATGTTGGCACTGACCAAGCAATGGTCTGCTGCTCTCTGGCCATCACCATAGAAGCCCG  | 180   |  |
| Db           | 52509        | ATACATGTTGGCACTGACCAAGCAATGGTCTGCTGCTCTCTGGCCATCACCATAGAAGCCCG  | 52450   |  |
| Qy           | 181          | GCTCCACATGCCCATCTACCTCTCTGCTGGGAGCTCTCTCTCATGGACCTCCTGTTAC  | 240   |  |
| Db           | 52449        | GCTCCACATGCCCATCTACCTCTCTGCTGGGAGCTCTCTCTCATGGACCTCCTGTTAC  | 52390   |  |
| Qy           | 241          | ATCTGTTGTCACTCCCAAGGCTTGGCGGACTTTCTGCGCAGAGAAAAACACTATCTCCTT  | 300   |  |
| Db           | 52389        | ATCTGTTGTCACTCCCAAGGCTT - GCGGACTTTCTGCGCAGAGAAAAACACTATCTCCTT  | 52331   |  |
| Qy           | 301          | TGGAGGCTGTGCATTCAGATGTCTCTGGCACTGACAAATGGGTAGCGCTGAGGACCTCCT  | 360   |  |
| Db           | 52330        | TGGAGGCTGTGCATTCAGATGTCTCTGGCACTGACAAATGGGTAGCGCTGAGGACCTCCT  | 52271   |  |
| Qy           | 361          | ACTGGCCCTTCATCGGCTTATGACAGGTATGCGGCAATTTGTCACTCTCTGAAATACATGAC  | 420   |  |
| Db           | 52270        | ACTGGCCCTTCATGGCTATGACAGGTATGTGGCAATTTGTCACTCTCTGAAATACATGAC  | 52211   |  |
| Qy           | 421          | CCTCATGAGCCCAAGAGTCTGTGGATCATGTGTGGCCATCCTCTGGATCCTGGCATCCCT  | 480   |  |
| Db           | 52210        | CCTCATGAGCCCAAGAGTCTGTGGATCATGTGTGGCCATCCTCTGGATCCTGGCATCCCT  | 52151   |  |
| Qy           | 481          | GATTGCTATAGGACATACCAATGACACTATGCACTTCCCTTCTGTGTCTCTGGGAAT   | 540   |  |
| Db           | 52150        | GATTGCTATAGGACATACCAATGACACTATGCACTTCCCTTCTGTGTCTCTGGGAAT   | 52091   |  |
| Qy           | 541          | CAGGCATCTCTCTGTGAGATCCACCCCTTGCTGGAAGTTGGCTGTGCTGTGATCCTCCAG  | 600   |  |

| Db | 52090 | CAGGCATCTGCTCTGTGAGATCCACCCCTTGTGAAGTTGSCCTGTGCTGATACCTCCAG   | 52031 |
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| Qy | 601   | GTATGAGCTTATAATATACGTCACAGGTGTGACTTTCCTTGTCTCCCATTTCTTGCCAT   | 660   |
| Db | 52030 | GTATGAGCTTATAATATACGTCACAGGTGTGACTTTCCTTGTCTCCCATTTCTTGCCAT   | 51971 |
| Qy | 661   | TGTGGCCTCCTACACACTAGTCCTATTCATCTGTGCTTCGTATGCCATCAATAGAGGGAG  | 720   |
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| Qy | 721   | GAAGAAAGCCCTGTGCACCTGCTCTCCACCTGATTCGGTCCGGAGTTCTATGGAGC      | 780   |
| Db | 51910 | GAAGAAAGCCCTGTGCACCTGCTCTCCACCTGATTCGGTCCGGAGTTCTATGGAGC      | 51851 |
| Qy | 781   | TGCCACATTCATGTATGTCTTGCCCAAGTTCTTCCACAGCCCCAAACAGACCAACATCAT  | 840   |
| Db | 51850 | TGCCACATTCATGTATGTCTTGCCCAAGTTCTTCCACAGCCCCAAACAGACCAACATCAT  | 51791 |
| Qy | 841   | CTCTGTTTTCTACACAATTTGTCATCTCCAGCCCTGAAATCAGTCATCTACAGCGTGAGAA | 900   |
| Db | 51790 | CTCTGTTTTCTACACAATTTGTCATCTCCAGCCCTGAAATCAGTCATCTACAGCGTGAGAA | 51731 |
| Qy | 901   | TAAGGAGGTCATGCGGGCCCTTCAGGAGGTCCTCGGAAATACATACCTGCTGGCACATTC  | 960   |
| Db | 51730 | TAAGGAGGTCATGCGGGCCCTTCAGGAGGTCCTCGGAAATACATACCTGCTGGCACATTC  | 51671 |
| Qy | 961   | CACGCTCTAGGAAGGA 977  |       |
| Db | 51670 | CACGCTCTAGGAAGGA 51654  |       |

RESULT 5

AX241682

LOCUS AX241682

DEFINITION Sequence 430 from Patent WO0127158.

ACCESSION AX241682

VERSION AX241682.1 GI:15798557

KEYWORDS synthetic construct

SOURCE synthetic construct

ORGANISM artificial sequences.

REFERENCE 1

AUTHORS Ballenbon,J., Smith,D., Lancet,D., Glusman,G., Fuchs,T. and Yanai,I

TITLE Olfactory receptor sequences

JOURNAL Patent: WO 0127158-A 430 19-APR-2001;

FEATURES

source

1. 947

/organism="synthetic construct"

/mol\_type="unassigned DNA"

/db\_xref="taxon:32630"

/note="(A38279 nucleotide)"

ORIGIN

|    | Query Match.                 | 95.8%   | Score 936; | DB 6; | Length 947;       |
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|    | Best Local Similarity 99.9%; | Prod. No. 2.1e-267;   |            |       |                   |
|    | Matches 947; Conservative    | 0;  | Mismatches | 0;    | Indels 1; Gaps 1; |
| Qy | 20                           | ATGGAGTCGGGAACCCACCTTGGGAAGCGGTTTCATCTTGTTGGGATTCGAAATGAC         | 79         |       |                   |
| Db | 1                            | ATGGAGTCGGGAACCCACCTTGGGAAGCGGTTTCATCTTGTTGGGATTCGAAATGAC         | 60         |       |                   |
| Qy | 80                           | AGTGGGTCTCTGAACTGCTCTATGTCTACATTTTACAATCCTATACATGTTGGCACTGACC     | 139        |       |                   |
| Db | 61                           | AGTGGGTCTCTGAACTGCTCTATGTCTATGCTACATTTACAATCCTATACATGTTGGCACTGACC | 120        |       |                   |
| Qy | 140                          | AGCAATGGTCTGTGCTCTGGGCATCAACATAGAGCCCGGCTCCACATGCCCATGTAC         | 199        |       |                   |
| Db | 121                          | AGCAATGGTCTGTGCTCTGGGCATCAACATAGAGCCCGGCTCCACATGCCCATGTAC         | 180        |       |                   |
| Qy | 200                          | CTCTGTTGGGCAGCTCTCTCTCATGGACCTCTCTTTCASATCTGTGTCACTCCCAAG         | 259        |       |                   |